

# Muddying the waters

Should WA citizens drink recycled waste water?



# *Alliance for a Clean Environment*

**Promoting 'Community Right to Know' and Environmental Justice  
in WA since 1996**

- **Environmental Justice**
- **Environmental health protection**
- **Children's environmental health protection**
- **Chemical injury reform**
- **Contaminated sites**
- **Pollution/ Air Quality impacts**
- **Pesticides/chemical impacts**
- **Industrial regulation**
- **Public Engagement**
- **Community Empowerment (CRTK)**
- **Waste management**
- **Environmental protection**

# **Managed Aquifer Recharge under the microscope.**

*An environmental health and justice perspective.*

**On the basis of current international research, ACE does not support the introduction of recycled waste water into WA aquifers.**

## **Research shows that;**

- **World's best practice technology to purify water cannot remove all chemicals and pathogens. Some of these chemicals are known to cause adverse health impacts at extremely low levels.**
- **Endocrine disrupting chemicals, have been identified in drinking water supplies in Europe, US, UK, Australia, despite best practice treatment technology.**
- **Cytotoxic drugs have been found in UK drinking water supplies.**
- **Reclaimed water (even via RO and UD) is likely to contain pathogenic microorganisms.**
- **There are major data gaps in scientific knowledge about the type, quantities and adverse impacts that can arise from public exposure to the current level of contaminants found in recycled waste water.**

**WA has no regulatory framework to ensure the protection of public health and the environment from contaminated waste water entering WA aquifers.**

## ***Predetermined decisions?***

“The Floreat MAR project infiltrates approximately 50 kilolitres (the volume of an average household swimming pool) per day of secondary treated wastewater into the aquifer, from two galleries. More water can be passed through the aquifer by increasing the size or the number of infiltration galleries.”

***How long will it be before WA can reliably call on MAR water as a source?***

“MAR is already in use at one site, at Halls Head in Mandurah, and it is hoped to have more large scale sites functioning within three to four years time.”

# Civic participation in public health policy

- **Community right to know**
  - citizens have a right to know what chemicals they are being exposed to in their drinking water. (Bahai Declaration)
- **Public engagement**
  - Public health policy benefits from the inclusion of civil society
  - coproduction framework
- **Degree of risk**

The consideration of 'High Risk Proposals' that have the potential to irreversibly compromise the integrity and sustainability of our natural resources and life support systems, demands equitable, robust and inclusive public engagement processes.

**Community knowledge in environmental health science: co-producing policy expertise.**

**Environmental Science & Policy**

Volume 10, Issue 2, April 2007, Pages 150-161doi:10.1016/j.envsci.2006.09.0004

# Risk?



## Imposed vs voluntary

- Choosing to drive a car is not the same as mass medication of drinking water supplies
- Mitigation vs Elimination

## Risk Assessment is not science

- 62 opportunities for value judgements in a standard risk assessment
- Risk assessment does not account for children's vulnerability

## Irreversibility

- Pollution of the aquifer cannot be removed or controlled

# Who's assessing the risks?

**“The Water Corporation, as the proponent of the GWRT, will conduct an environmental risk assessment on the basis of the agreed Trial EVs and identify any situation or areas where the Trial EVs may not be protected as a result of the GWRT activities.”**

*(Trial Environmental Values for the Leederville Aquifer for the Groundwater Replenishment Trial, February 2008)*

**While we aim to best meet our customers' needs for now, we are also managing our assets and planning for Western Australia's water future. Our Security through Diversity approach to future water needs involves building and managing a portfolio of water supply and demand programs while balancing environmental, social and economic outcomes. My italics)**

*(Watercorp website)*

# Regulation in WA?

## Chemicals

- **Australia currently has no statutory environmental criteria for the residues of chemicals in the environment. (EPHC.)**
- **38 000 existing chemicals in use in Australia have not been adequately assessed for health or environmental impacts. (NICNAS)**
- **1500 new chemicals released onto the Australian market every year. (NICNAS)**

# Regulation in WA?



## Government Agencies

Parliamentary Inquiries – Waste Control (2001), Alcoa (2004), Esperance (2007)

*Industry regulation by the Department of Environment and Conservation is grossly inadequate.*

*DEC staff and resources assigned to approving projects vastly outweighs the staff and resources assigned to post approval compliance monitoring and auditing.*

*( Findings of the WA Parliamentary Inquiry into the cause and extent of the lead pollution in the Esperance area 2007)*

# Waste Control fire



## **Chemical Storage at the Waste Control Site:**

**...from the time of the first regulatory agency inspection did not comply with regulations; and**

**...at no time was in complete compliance with either the DEP or DME licence conditions.**

**(Finding 12. p29, Bellevue Hazardous Waste Fire Inquiry 2002)**

# Incompetence or industry capture?

- DEC met only 28% of its annual inspection targets
- Lack of compliance culture
- Lack of Departmental organisational structures led to a lack of corporate knowledge and inexperienced staff
- A critical lack of resources which can only be justified if industry self regulation is effective.

*( Findings of the WA Parliamentary Inquiry into the cause and extent of the lead pollution in the Esperance area 2007)*

# Health Impact Assessment

- Rec 8.** The EIA process as contained in the EP Act 1986 be expanded to:
- Incorporate a health impacts assessment where appropriate; and
  - Involve the Health Department of WA in the process of the health impact assessment.

*(Bellevue Fire report 2002)*

- Rec 29.** The Committee recommends that the Government review legislation and make necessary amendments to ensure that the Dep't of Health has a formal role in advising the Environmental Protection Authority in relation to the assessment of projects that may impact on public health.

*(Alcoa Refinery at Wagerup Inquiry 2004)*

- Rec 10.** The Committee recommends that there be a legislative requirement for the Department of Health to conduct a health impact assessment as part of the Environmental Assessment Process.

*(Inquiry into the Cause and Extent of Lead Pollution in the Esperance Area 2007)*

# Treatment technologies

**Microfiltration (MF)**  
**Ultrafiltration (UF)**  
**Nanofiltration (NF)**  
**Reverse Osmosis (RO)**

**“NF and RO cannot be considered as absolute barriers for all PPCP’s because studies have shown that trace amounts of some PPCP’s are found in RO treated effluent.”**

***Pharmaceutical and Personal Care Product Contaminants and Endocrine Disrupting Compounds in Water and Waste Water.***

***(Offices of Compliance and Regulatory Affairs, Community Relations and Pima County Regional Waste Water Reclamation Department, USA, March 28, 2008.)***

# Chemicals of concern

- **Perfluoroalkyl compounds** (breakdown to PFOS, PFOA)
- **Polybrominated diphenyl ethers (PBDE's)**
- **Endocrine disruptors** (cosmetics and personal care products)
- **Pesticides**
- **Pharmaceutical drugs**
  - -cytotoxic drugs (chemotherapy)
  - -radioactive residues
  - antibiotics

# Why should we be concerned about chemicals in the environment and in our drinking water?

- Persistence
- Bioaccumulation
- Transboundary
- Toxic
  - Carcinogenic, Mutagenic, Reproductive toxin



# Children's Environmental Health Protection as a Policy Driver



- **Children are not little adults**
- **Chemicals interrupt fundamental windows of development, causing long term impacts.**
- **Children uptake more pollution than adults**
- **Children's toxic elimination processes are undeveloped.**
- **Chemical body burden's are increasing by generation.**
- **Our children (including in vitro) are the most vulnerable.**

***Protect children's environmental health and you protect the planet***

# Triclosan

**Environmental Hazards & Risks of Triclosan (EPHC 2008)  
Priority Existing Chemical Assessment (NICNAS 2008)**

- **Bioaccumulative and persistent in the environment**
- **Uses include- cosmetics, PCP's, cleaning agents, therapeutic products, textiles and plastics.**
- **Exposure through –dermal, oral, inhalation and breast milk.**
- **Inhalation toxicity, irritant to eyes, skin and respiratory system, damages liver and alters biochemistry of the body.**
- **Byproducts include dioxins and dibenzofurans.**
- **High-very high aquatic toxin**
- **Triclosan found in all effluent discharge whether treated or untreated exceeded the acceptable standards for protection of the environment.**

# Nanomaterials

- **Manipulating materials and systems at the scale of atoms and molecules.**
- **“Nanomaterials” measure less than 100 nanometres – one hundred thousandth of one metre!**
- **The properties of matter change at the nano scale, eg colour, chemical reactivity**
- **Nanomaterials include -Sunscreens & cosmetics, fabrics, clothes, paints & varnishes, fuel catalysts, automotive & aerospace components, bottle coatings, Agricultural chemicals, even some foods...**
- **Nanomaterials are readily inhaled, can be ingested and can possibly also cross skin**
- **Nanomaterials gain access to tissues and cells that larger particles cannot**
- **Inhaled nanoparticles can cross the blood-brain barrier**
- **Australia has no standards for protection of the environment and human health from the adverse impacts of nanomaterials.**
- **Australia has no regulatory framework to manage the risks and hazards posed to human health and the environment through the widespread use and application of nanomaterials.**
- **The worldwide market for nanotechnology-enabled products is expected to exceed \$1 trillion a year by 2015.**

# Does WA have a sustainable water conservation policy?

- **Managed Aquifer Recharge for drinking water supplies should be an option of last resort.**
- **Cleanest water should be saved for most sensitive end uses (drinking, high human contact)**
- **Water Conservation through improved efficiency.**
- **Increase the price of clean potable drinking water .**
- **Reduce the use of WA aquifers for non drinking water uses.**

## **Secondary treated waste water**

- **Industry and Mining (non human contact) - 100% recycled water**
- **Non consumptive crops (non human contact) -100% recycled water**

## **Tertiary treated waste water**

- **Consumptive Agriculture**
- **Commercial and industry (human contact)**
- **Domestic grey water systems**
- **Local Government parks and gardens management**
- **Turf farms**
- **Sports ovals**
- **Public open spaces**

## **Waste Water classification**

- **Are the standards we currently use sustainable and adequate to ensure the protection of the environment and public health?**
- **Should secondary treated waste water be pumped out to sea? Pathogens, industrial chemicals, PPCP's have been identified in recycled waste water at a secondary level.**
- **Should cleaner waste water be used for agriculture? Reducing the levels of contaminants entering the environment and the food chain, mixing with pesticides and fertilisers.**
- **Should we reduce the amounts of pesticides sprayed in parks and open spaces so as to reduce the impacts on our aquifers. For example Simazene and the response from the South Australian Government.**

# **Biosolids and Effluent use - contaminating our aquifers**

- **Are the standards for the use of bio solids for soil conditioning and composting safe enough to protect human health and the environment, particularly groundwater?**
- **Radioactive isotopes, Triclosan, PFOS/PFOA, pharmaceutical drugs, pathogens, antibiotic resistant bacteria, PBDE's, heavy metals have all been identified in sewage sludge, bio solids and waste water effluent that continues to be widely spread in the environment.**
- **Sewage sludge and waste water effluent have become a major contributor to the widespread contamination of soil and aquatic ecosystems, globally.**
- **The long term impacts are largely unknown.**

# The elephants in the room.



**Consumption**  
**Waste**  
**Overpopulation**

